



# Development of TMDLs for Nutrients: Lower Salinas River Watershed *Monterey County*

## **TMDL Kickoff Meeting**

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*Central Coast RWQCB TMDL Program*

**Salinas River @ Chualar River Road**  
Photo: USGS



# ***Why are We Here?...***

- **Water Quality Problem = Special Study (TMDL)**
  - Nitrate Standard Violations
  - Dissolved Oxygen Violations
  - Excessive Biostimulatory Substances
  
- **Engage and Inform Stakeholders & Interested Parties**

# ***Topics at a Glance...***

- **Water Board: Function & Goals**
- **TMDL: What is it?**
- **Nutrient Pollution**
- **Lower Salinas Watershed Nutrient TMDL**
  - **Background & Preliminary Data**
  - **Approval process**
- **Discussion**

## What the Water Board Does

### *Protect Water Quality*

- Local and Regional Level
- Regulate Discharges
  - Calif. Water Code (State)
  - Clean Water Act (Fed)





A photograph of a river, identified as the Old Salinas River, showing a large sediment bar in the middle of the channel. The water is murky brown, and the surrounding landscape is green with some dry brush. In the background, there are mountains under a clear sky.

# ***What is a TMDL?...***

**The maximum amount of a pollutant(s) that a surface waterbody can receive and still meet water quality standards...**

- ***A TMDL is the State's formal process to clean up impaired surface waters.***

# ***Why Do a TMDL?...***

## ***Federal Clean Water Act:***

**States Must “List” Impaired Waterbodies  
Not Meeting WQ Standards**



## ***“Listed” Waterbodies:***

**States (Water Board) must address = TMDL**



## ***Lower Salinas River Watershed:***

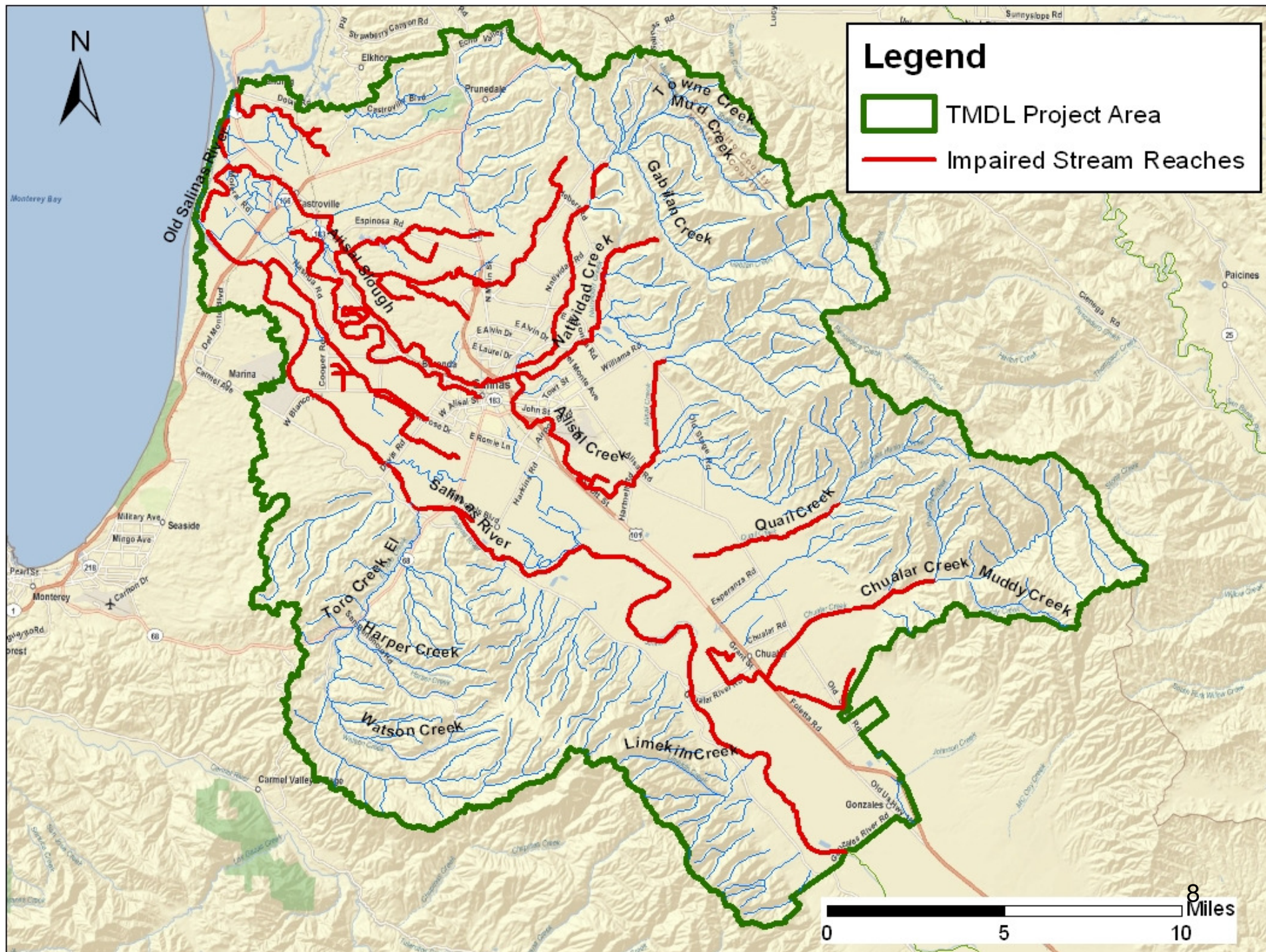
**61 “Listings” for Nutrients and Nutrient-  
related WQ Impairments**

# ***Map of Waterbodies Listed for Impairments\*...***

## ***Lower Salinas River Watershed***

***\* Includes 2006 303(d) Listings and Proposed 2010 303(d) listings***







## ***“Nutrients”...***

- **What are they?**
- **What is the Environmental Problem?**

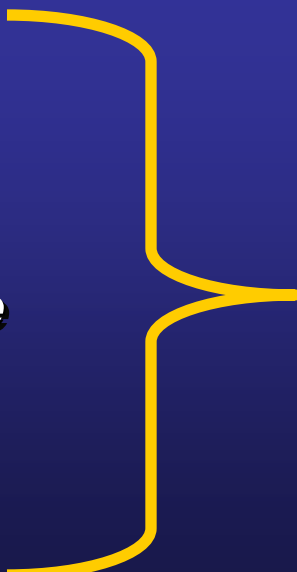
**Nutrients = Nitrogen (N) and Phosphorus (P)**

***Excessive Nutrients may cause...***

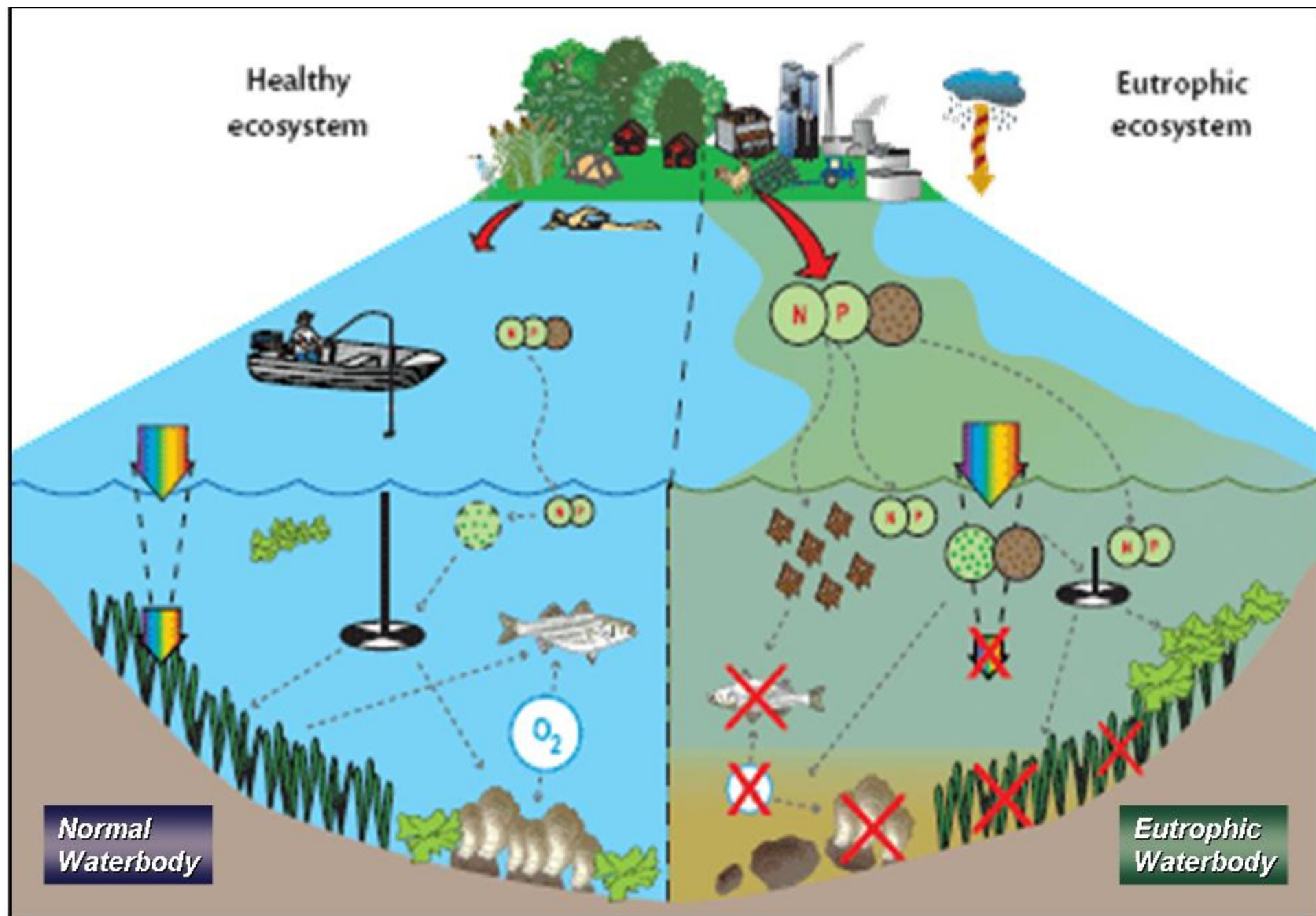
➤ **Toxic Effects**

➤ **Eutrophication**

- *Harmful excess algae biomass*
- *Alter dissolved oxygen balance*
- *Increased Turbidity*
- *Decreased Biological Diversity*
- *Public Health Nuisance*



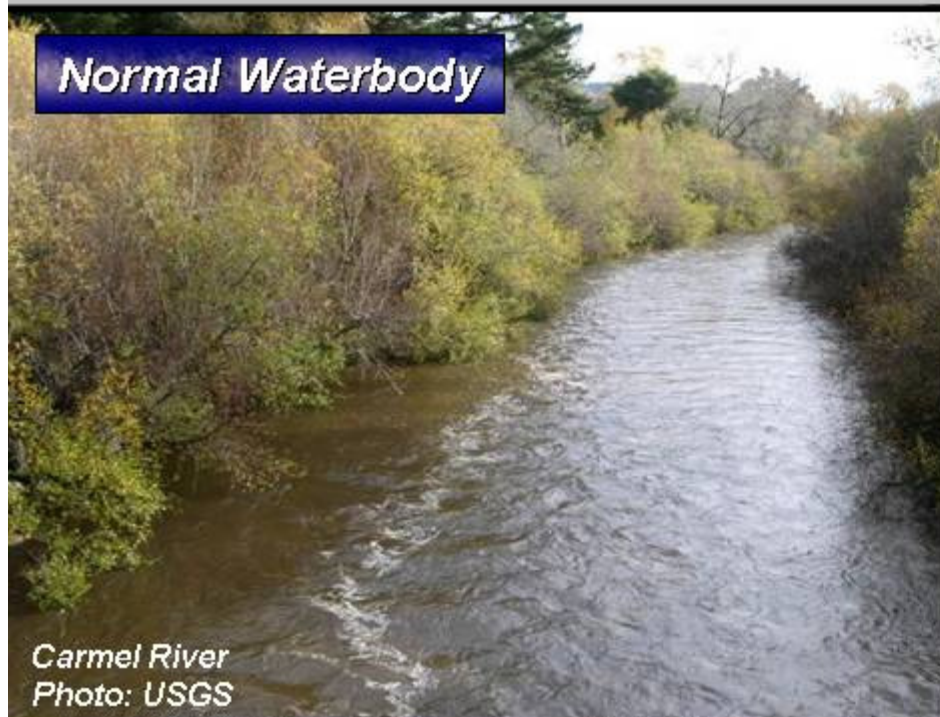
**Impairment  
of  
Waterbody**



Picture Credit:  
NOAA-U.S Dept. of Commerce



## Normal Waterbody



Carmel River  
Photo: USGS

## Eutrophic Waterbody

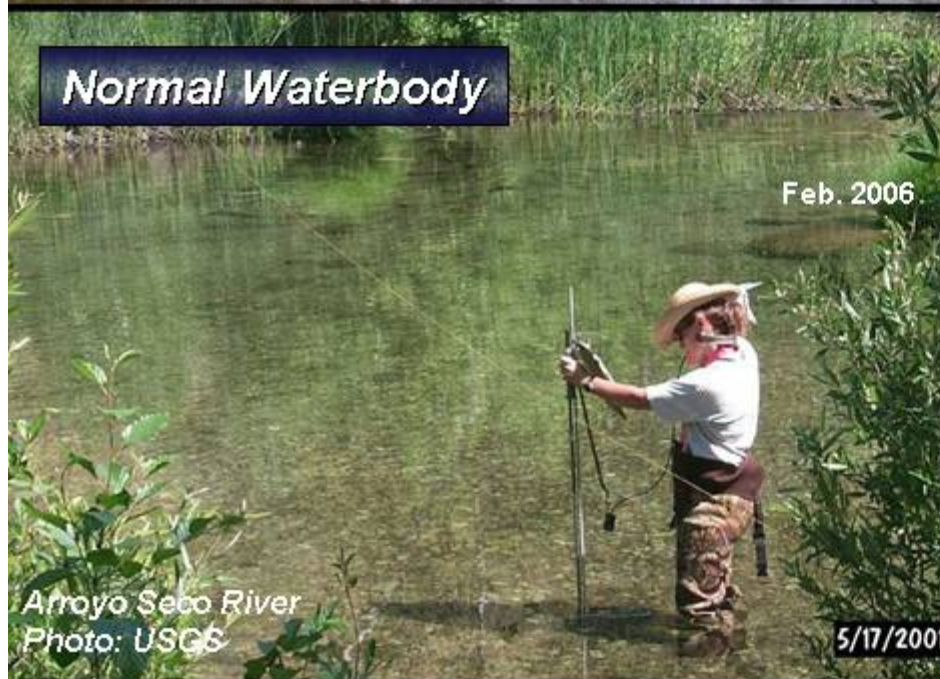


Aug. 2000

Algal Cover

Reclamation Canal  
Photo: Joel Casagrande, CSUMB

## Normal Waterbody



Feb. 2006

Arroyo Seco River  
Photo: USGS

5/17/2001

## Eutrophic Waterbody



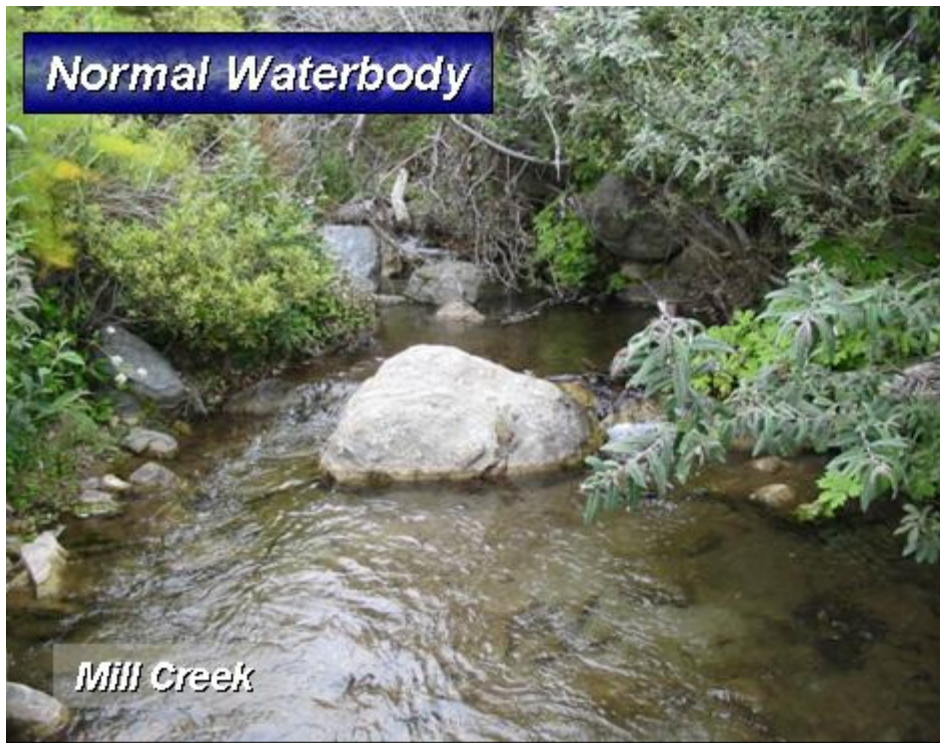
Feb. 2006

Quail Creek  
Photo: Coop. Monitoring Program

116

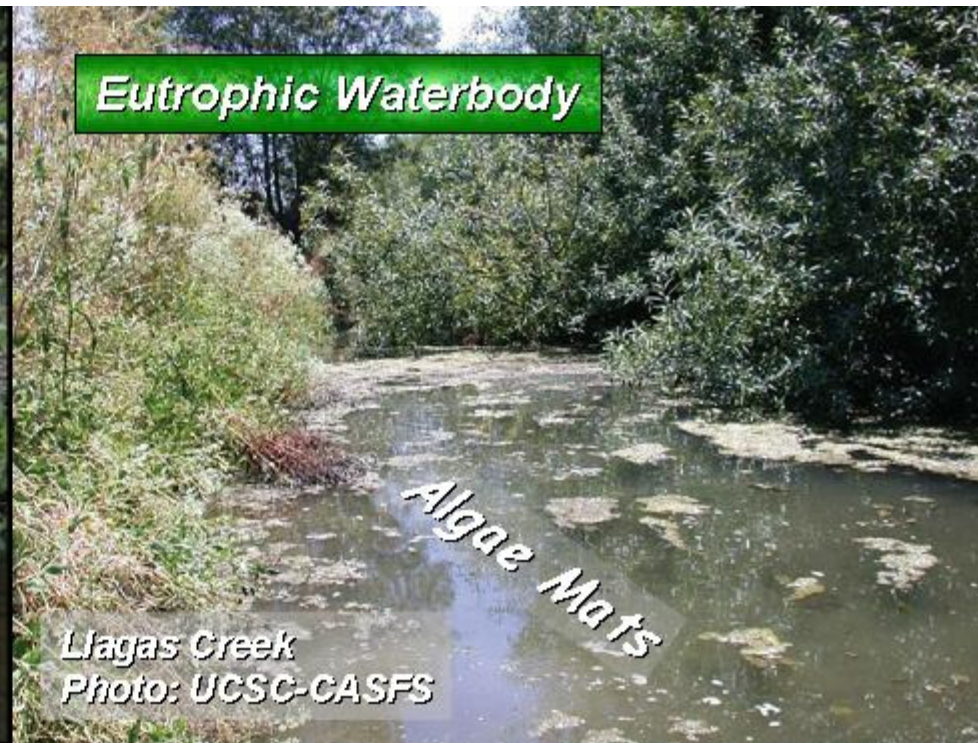


**Normal Waterbody**



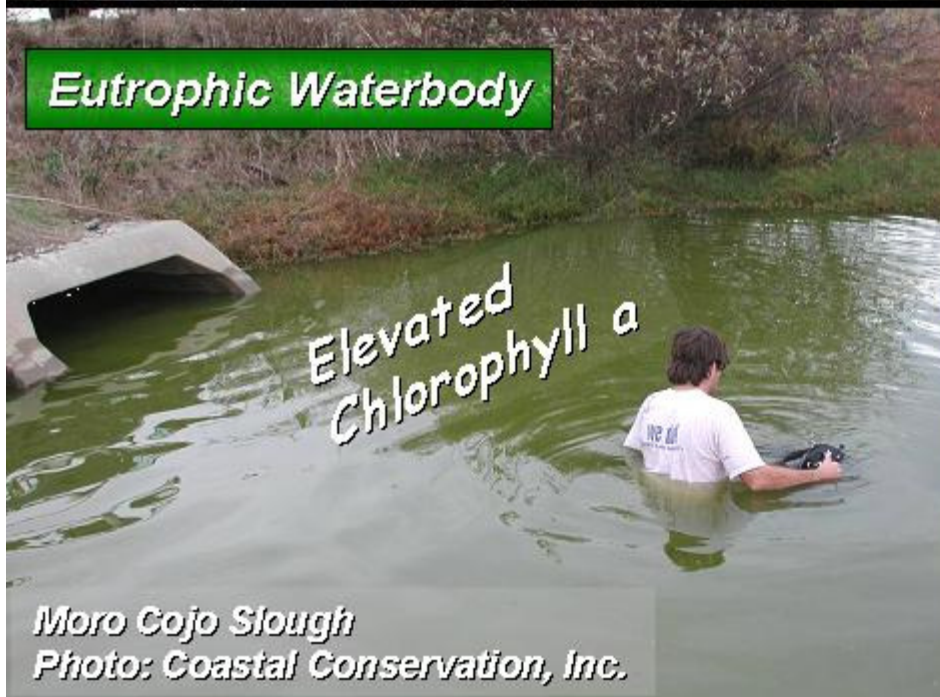
*Mill Creek*

**Eutrophic Waterbody**



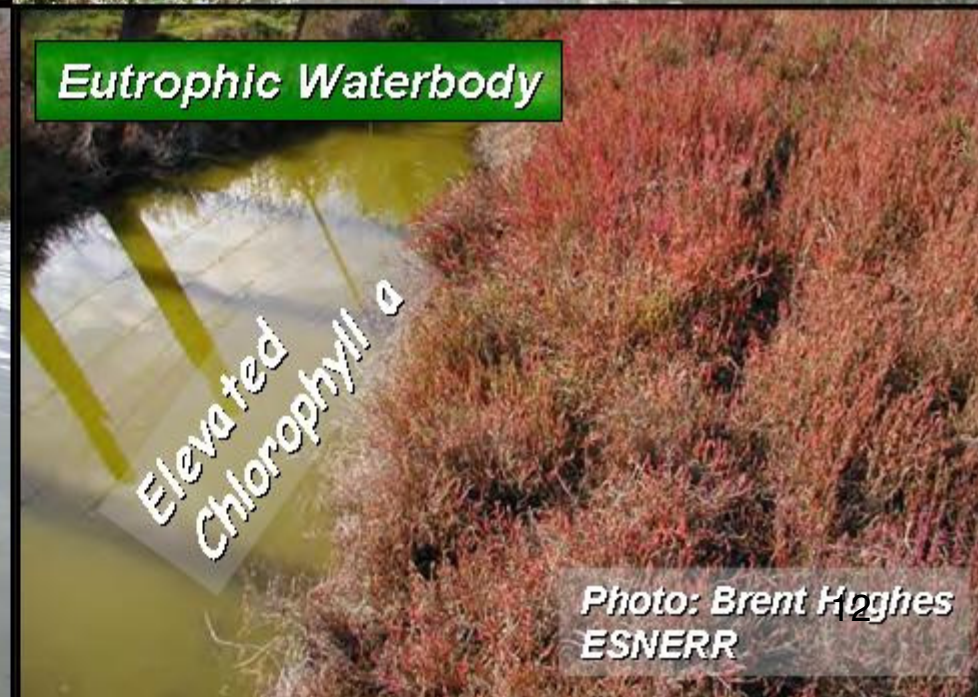
*Liagas Creek  
Photo: UCSC-CASFS*

**Eutrophic Waterbody**



*Moro Cojo Slough  
Photo: Coastal Conservation, Inc.*

**Eutrophic Waterbody**



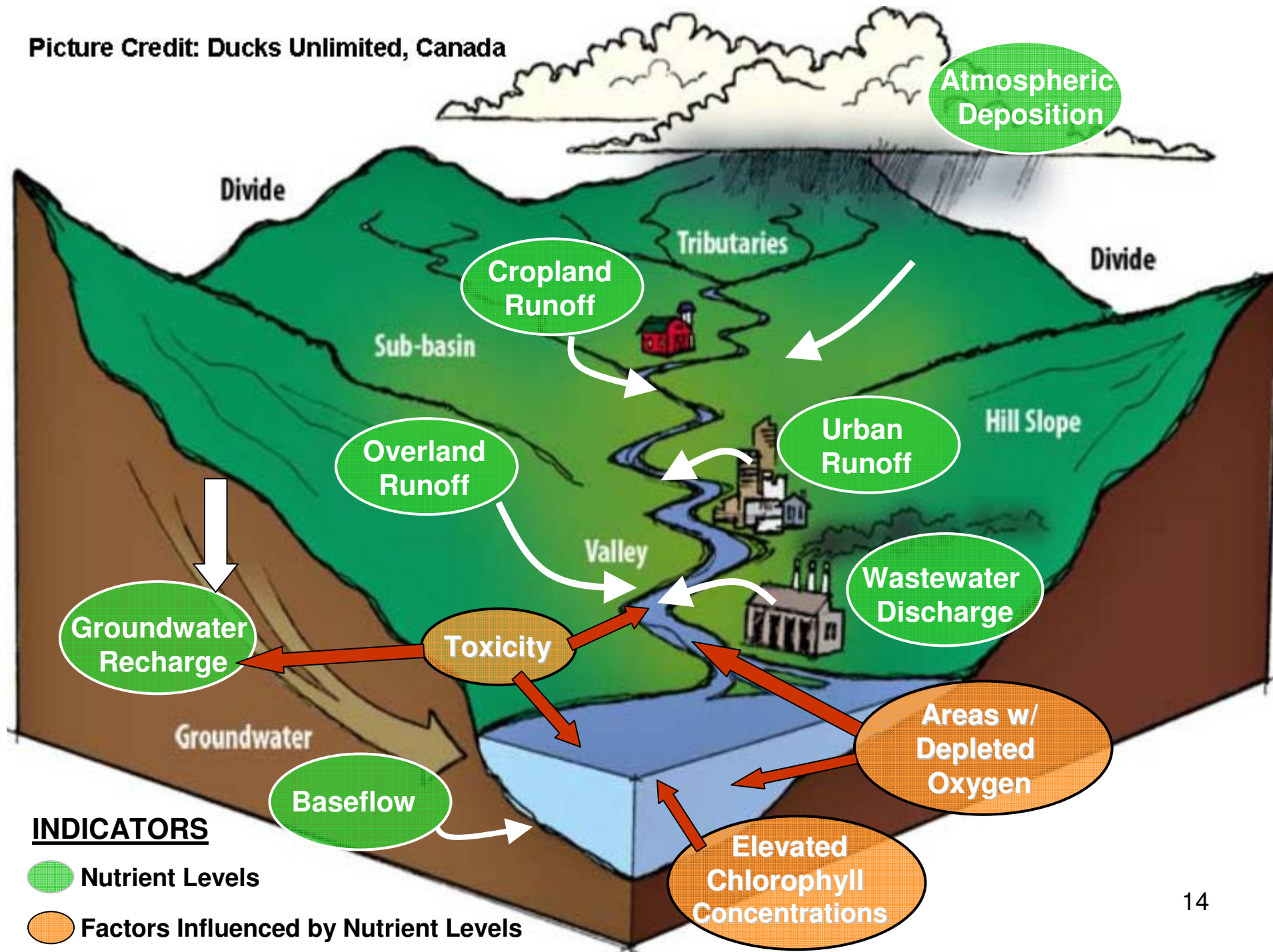
*Photo: Brent Hughes  
ESNERR*



## ***Nutrient Pollution:***

# **Transport & Possible Sources...**

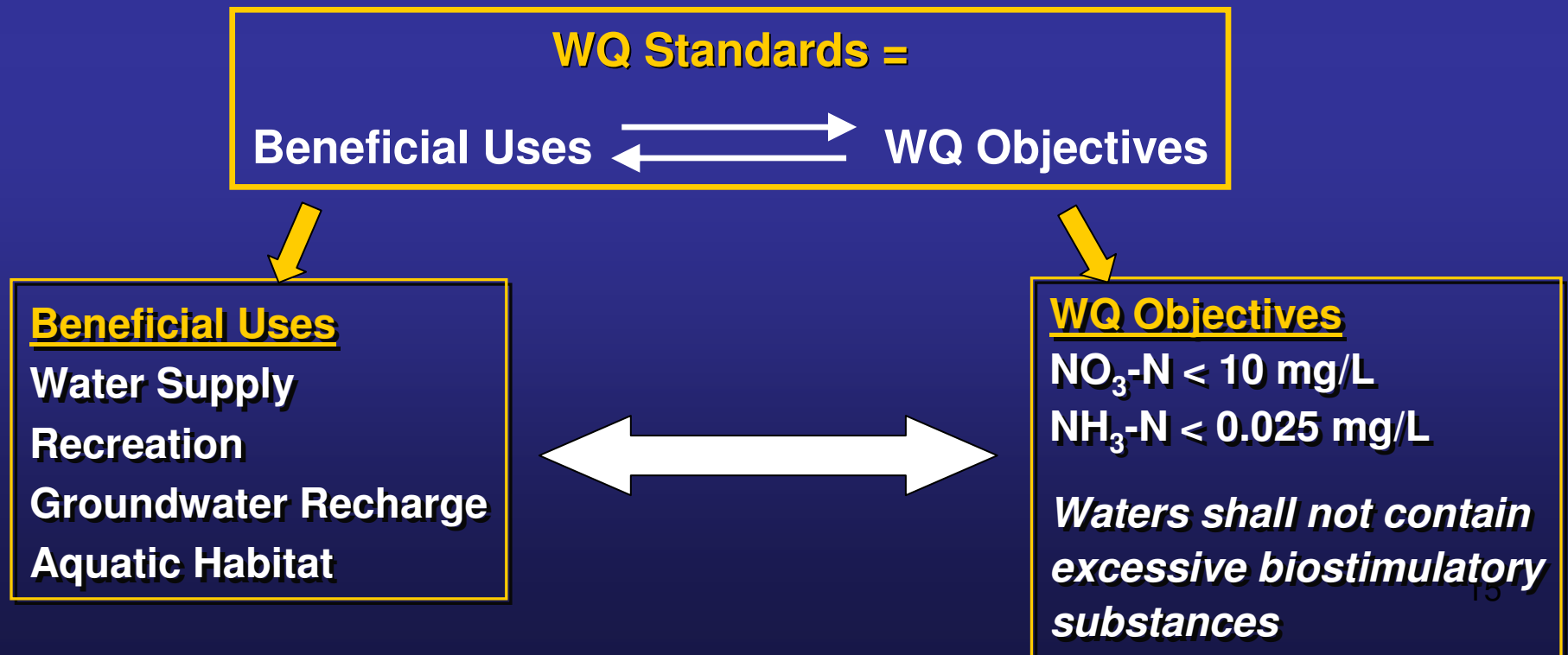
Picture Credit: Ducks Unlimited, Canada





# TMDLs & Water Quality Standards....

**TMDLs:** “*Shall be established **at a level** necessary to implement the **applicable water quality standards***” (Clean Water Act)



## USEPA's *Ecoregional Nutrient Criteria*

Ambient Nutrient Concentrations Highly Variable:  
*Soils, Climate, Geology, Vegetation, etc.*

### EPA Nutrient Criteria for Ecoregion III-6

- Total N (mg/L) 0.52
- Total P (mg/L) 0.03



California Chaparral and Oak Woodlands Ecoregion

MAP:  
Level III Ecoregions  
of the United States



# ***Lower Salinas River Watershed Nutrient TMDL...***

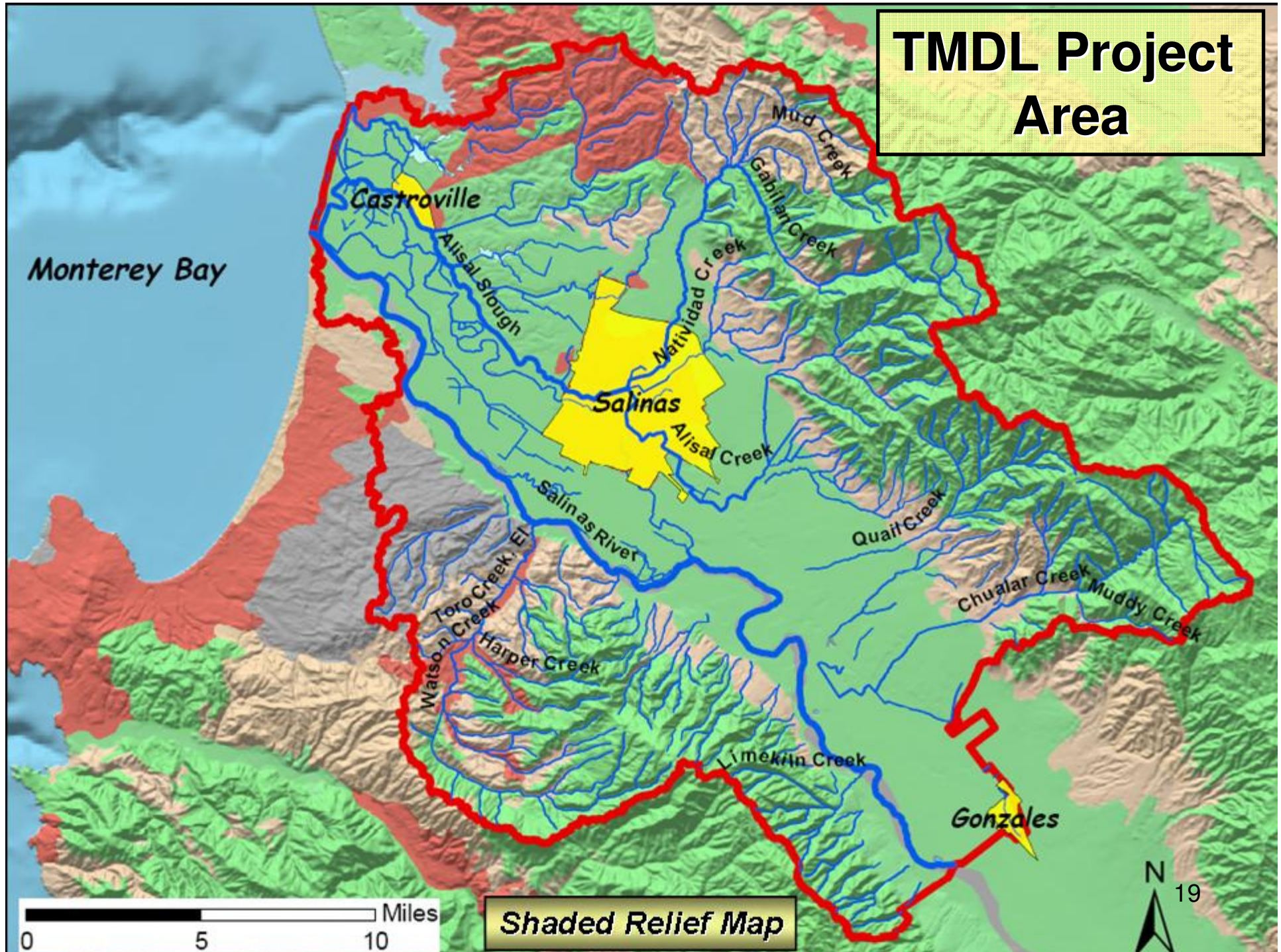
- **Background Info**
- **Preliminary Data**

**TMDL  
Project Area**

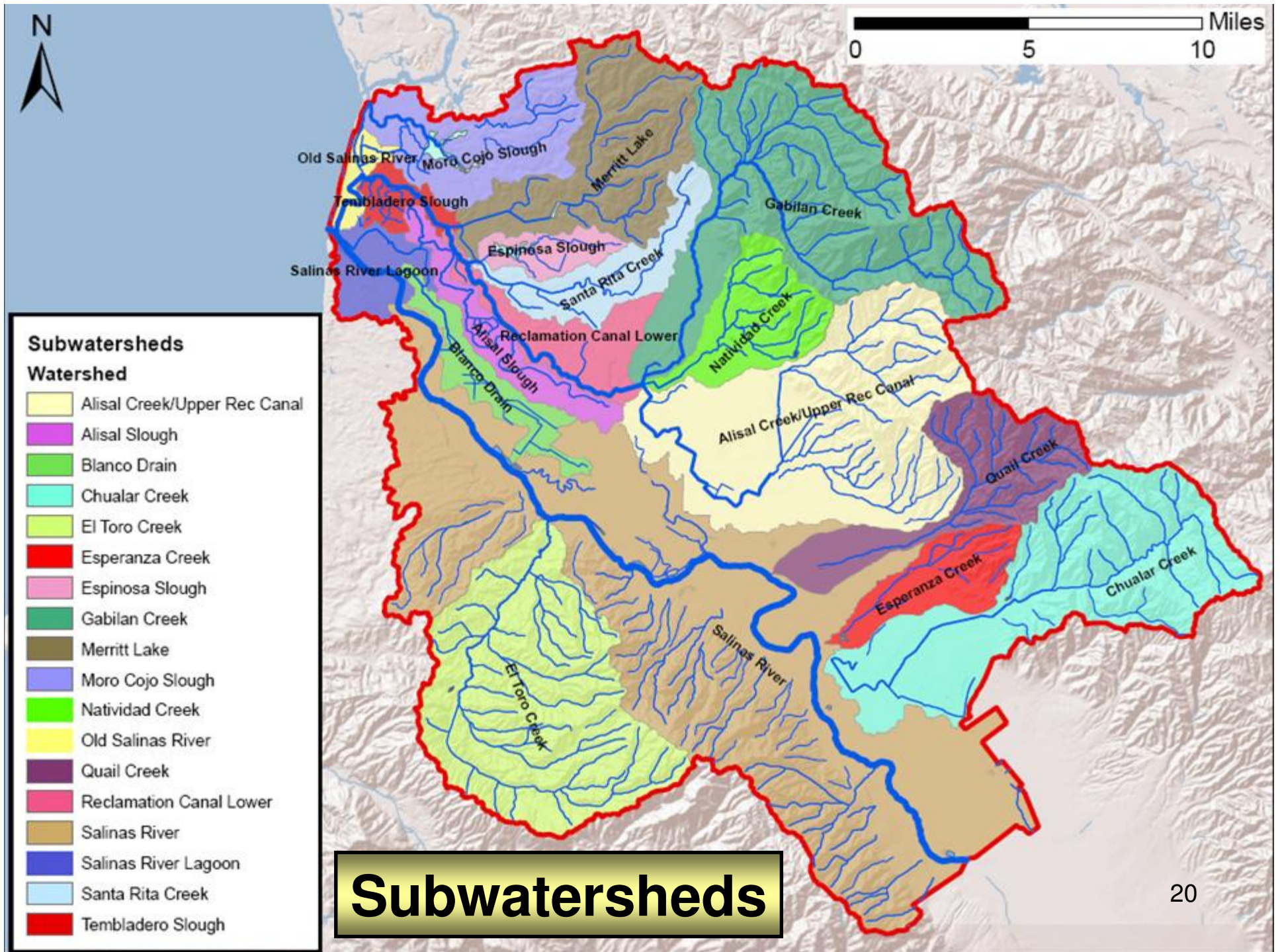




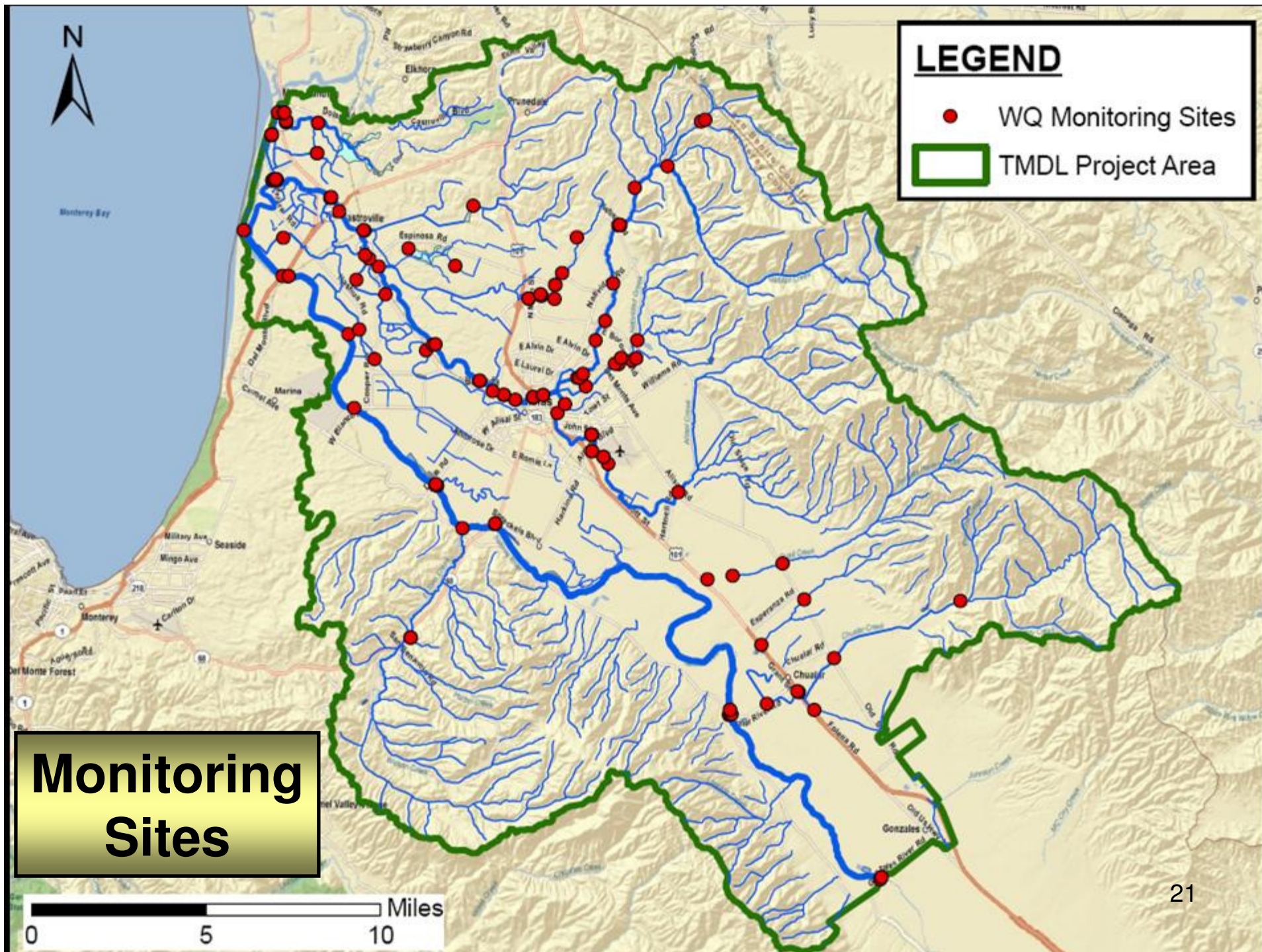
# TMDL Project Area











# ***Preliminary Water Quality Data ...***



**Monterey County**  
**Median N Concentrations**  
*CCAMP & CMP monitoring sites*

**LEGEND**

Total Nitrogen, Median (mg/L)

Median

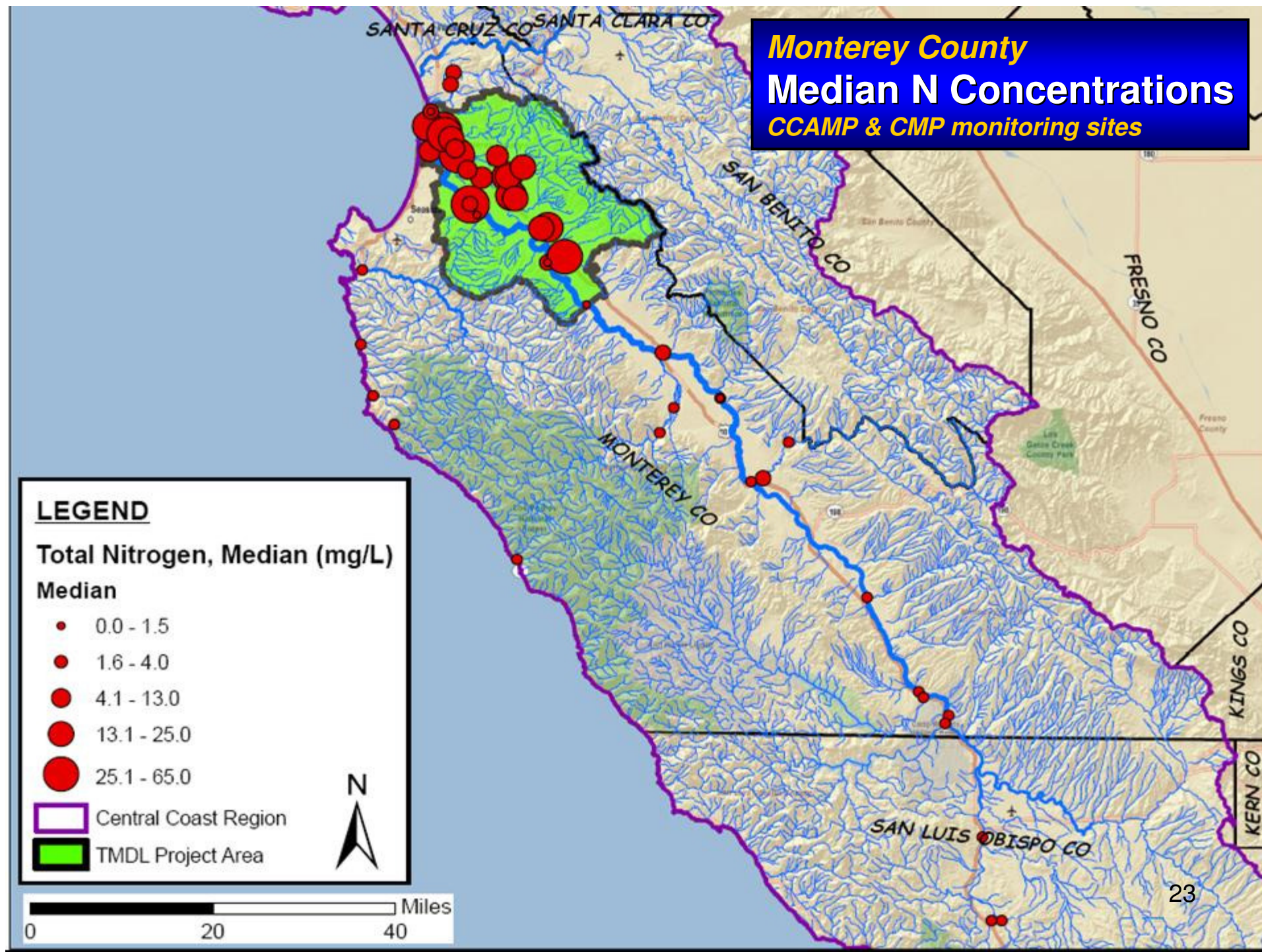
- 0.0 - 1.5
- 1.6 - 4.0
- 4.1 - 13.0
- 13.1 - 25.0
- 25.1 - 65.0

Central Coast Region

TMDL Project Area



0 20 40 Miles





**Monterey County**  
**Median PO<sub>4</sub> Concentrations**  
*CCAMP monitoring sites*

**LEGEND**

Phosphate, Total as P, Median (mg/L)

Median

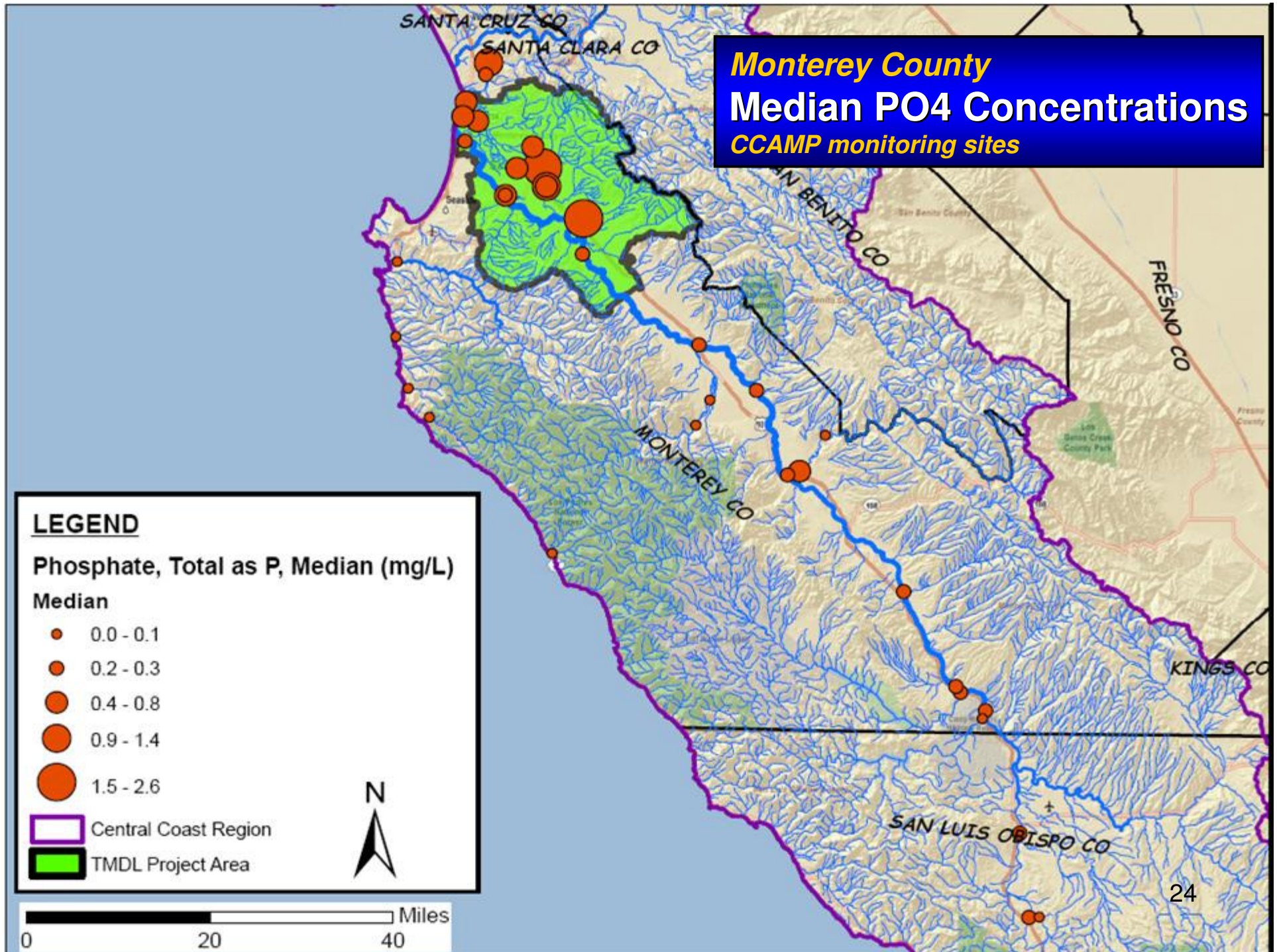
- 0.0 - 0.1
- 0.2 - 0.3
- 0.4 - 0.8
- 0.9 - 1.4
- 1.5 - 2.6

Central Coast Region

TMDL Project Area



0 20 40 Miles





# Nutrient Loading Risk...

## Export Coefficient Model (ECM)<sup>A</sup>:

(1) Land Use/Land Cover



*Plus...*

(2) Runoff potential (soils)<sup>B</sup>

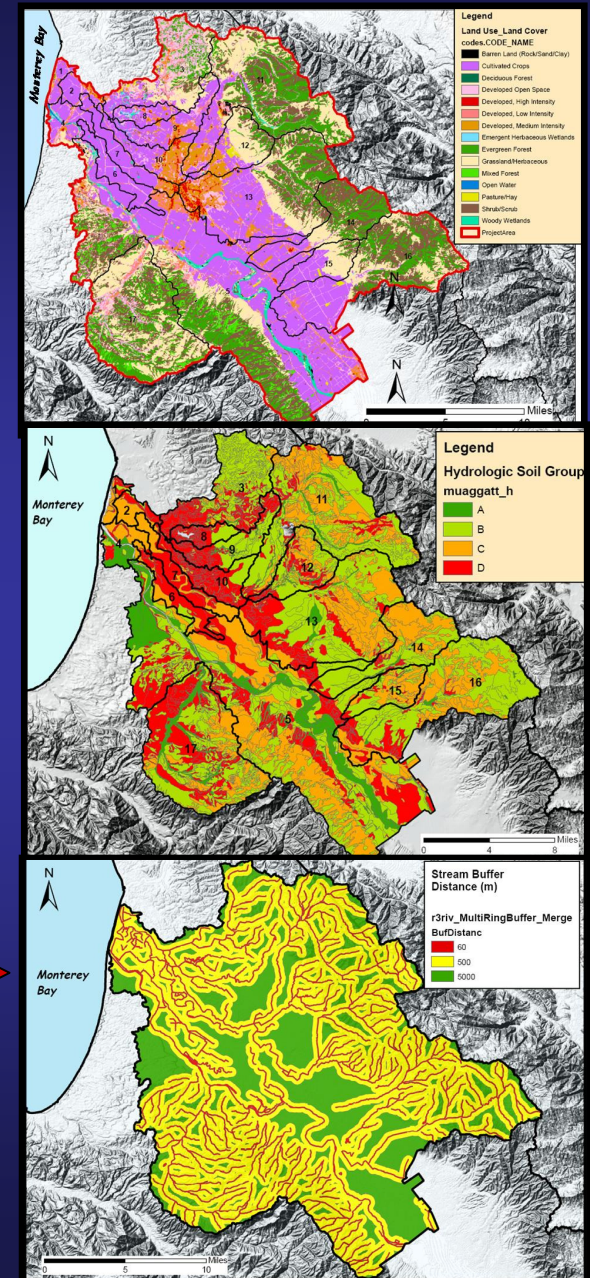


*Plus...*

(3) Proximity to surface water<sup>C</sup>



**= Spatial Distribution of Loading**



### Literature Sources:

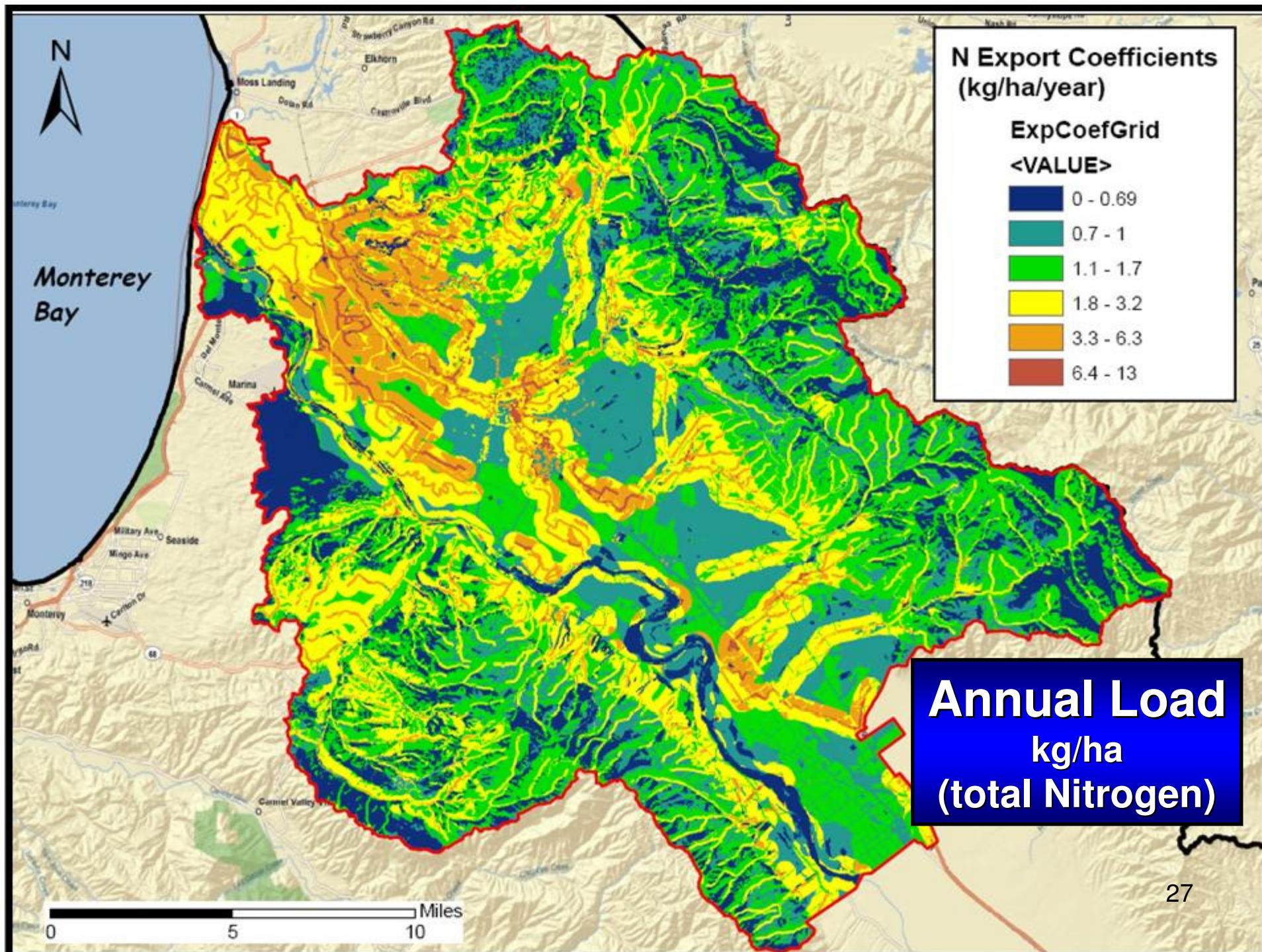
A – Reckhow et al., 1980; B – Kellog et al., 1996; C – Jones and Heathwaite, 1996

# ***Spatial Distribution of Nitrogen Loads\*...***

## ***Lower Salinas River Watershed***

***\* Preliminary and Provisional Assessment***



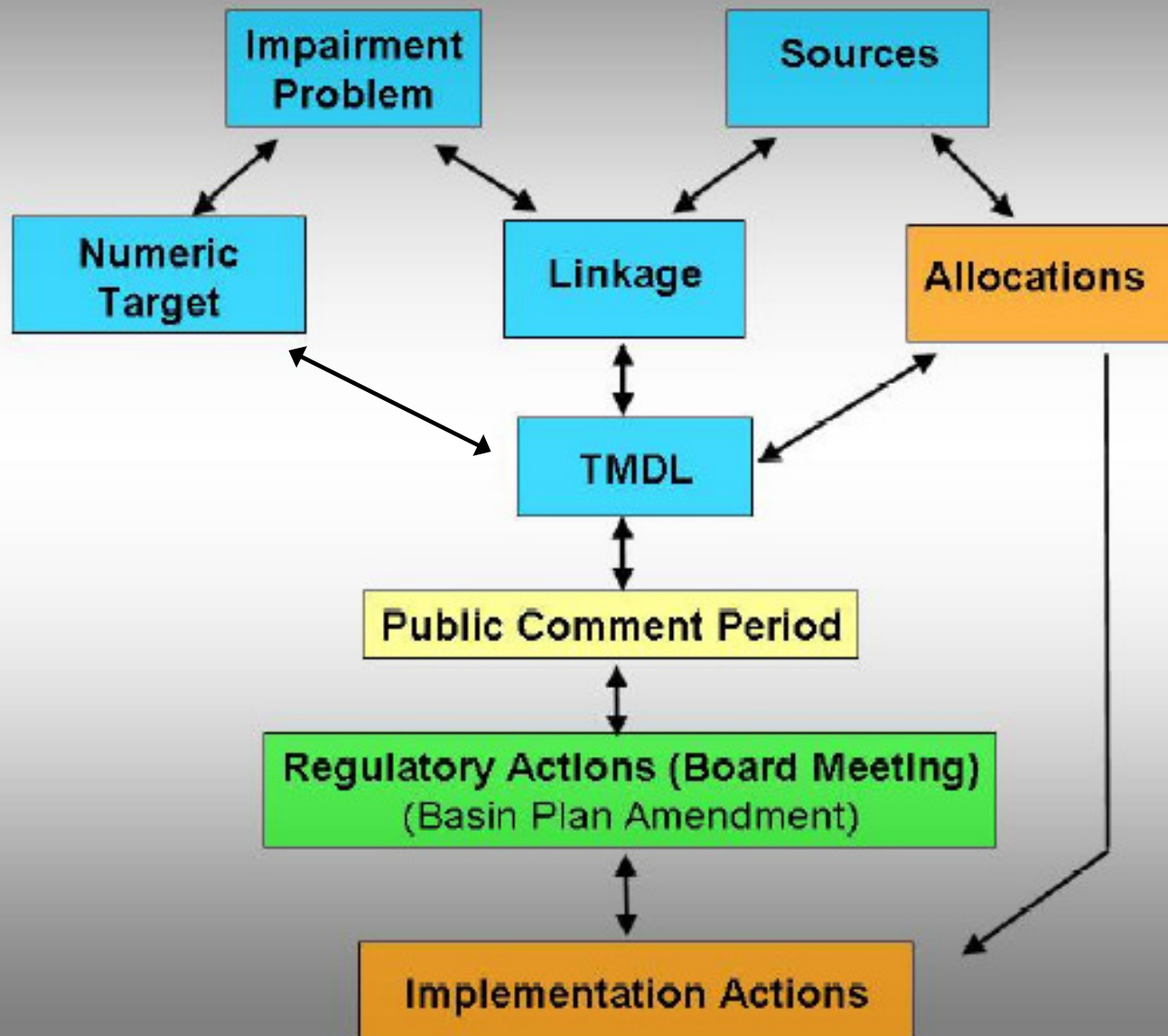


# ***Lower Salinas River Watershed Nutrient TMDL...***

- **The TMDL Process**
- **TMDL Approval Timeline (tentative)**



# TMDL Components



## ***TMDL Development & Approval Timeline...***

- Data Analysis (**Summer 2010**)
- CEQA Scoping – Preliminary Project Report (**Fall 2010**)
- Scientific Peer Review (**Winter-Spring 2010-11**)
- Final Project Report/BPA (**Summer-Fall 2011**)
- Regulatory Action (Board Meeting) (**Fall 2011**)

Sea Otter  
Example of Eutrophication – Algae  
Photo: Kerstin Wasson - ESNERS



## ***Water Board Staff Contacts...***

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- **Chris Rose:** *TMDL Program Manager*

**Water Board TMDL Webpage:**

**[www.swrcb.ca.gov/centralcoast/water\\_issues/programs/tmdl](http://www.swrcb.ca.gov/centralcoast/water_issues/programs/tmdl)**

# Questions & Comments...



08/22/2005

*Salinas River @ Spreckels*  
*Photo:USGS*